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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
JUNG, UNSU	

ART UNIT	PAPER NUMBER
1641	

NOTIFICATION DATE	DELIVERY MODE
09/24/2010	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

docket_ip@pillsburylaw.com

Advisory Action Before the Filing of an Appeal Brief	**Application No.** 10/814,982	**Applicant(s)** DUBIN ET AL.	
	Examiner UNSU JUNG	**Art Unit** 1641	

--The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

THE REPLY FILED 24 August 2010 FAILS TO PLACE THIS APPLICATION IN CONDITION FOR ALLOWANCE.

1. ☒ The reply was filed after a final rejection, but prior to or on the same day as filing a Notice of Appeal. To avoid abandonment of this application, applicant must timely file one of the following replies: (1) an amendment, affidavit, or other evidence, which places the application in condition for allowance; (2) a Notice of Appeal (with appeal fee) in compliance with 37 CFR 41.31; or (3) a Request for Continued Examination (RCE) in compliance with 37 CFR 1.114. The reply must be filed within one of the following time periods:
   a) ☒ The period for reply expires *3* months from the mailing date of the final rejection.
   b) ☐ The period for reply expires on: (1) the mailing date of this Advisory Action, or (2) the date set forth in the final rejection, whichever is later. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of the final rejection.

   Examiner Note: If box 1 is checked, check either box (a) or (b). ONLY CHECK BOX (b) WHEN THE FIRST REPLY WAS FILED WITHIN TWO MONTHS OF THE FINAL REJECTION. See MPEP 706.07(f).

Extensions of time may be obtained under 37 CFR 1.136(a). The date on which the petition under 37 CFR 1.136(a) and the appropriate extension fee have been filed is the date for purposes of determining the period of extension and the corresponding amount of the fee. The appropriate extension fee under 37 CFR 1.17(a) is calculated from: (1) the expiration date of the shortened statutory period for reply originally set in the final Office action; or (2) as set forth in (b) above, if checked. Any reply received by the Office later than three months after the mailing date of the final rejection, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

NOTICE OF APPEAL

2. ☐ The Notice of Appeal was filed on _____. A brief in compliance with 37 CFR 41.37 must be filed within two months of the date of filing the Notice of Appeal (37 CFR 41.37(a)), or any extension thereof (37 CFR 41.37(e)), to avoid dismissal of the appeal. Since a Notice of Appeal has been filed, any reply must be filed within the time period set forth in 37 CFR 41.37(a).

AMENDMENTS

3. ☐ The proposed amendment(s) filed after a final rejection, but prior to the date of filing a brief, will not be entered because
   (a) ☐ They raise new issues that would require further consideration and/or search (see NOTE below);
   (b) ☐ They raise the issue of new matter (see NOTE below);
   (c) ☐ They are not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal; and/or
   (d) ☐ They present additional claims without canceling a corresponding number of finally rejected claims.

   NOTE: _____. (See 37 CFR 1.116 and 41.33(a)).
4. ☐ The amendments are not in compliance with 37 CFR 1.121. See attached Notice of Non-Compliant Amendment (PTOL-324).
5. ☐ Applicant's reply has overcome the following rejection(s): _____.
6. ☐ Newly proposed or amended claim(s) _____ would be allowable if submitted in a separate, timely filed amendment canceling the non-allowable claim(s).
7. ☒ For purposes of appeal, the proposed amendment(s): a) ☐ will not be entered, or b) ☒ will be entered and an explanation of how the new or amended claims would be rejected is provided below or appended.
   The status of the claim(s) is (or will be) as follows:
   Claim(s) allowed: _____.
   Claim(s) objected to: _____.
   Claim(s) rejected: *1,7-16,19-21 and 54-59*.
   Claim(s) withdrawn from consideration: *5*.

AFFIDAVIT OR OTHER EVIDENCE

8. ☐ The affidavit or other evidence filed after a final action, but before or on the date of filing a Notice of Appeal will not be entered because applicant failed to provide a showing of good and sufficient reasons why the affidavit or other evidence is necessary and was not earlier presented. See 37 CFR 1.116(e).
9. ☐ The affidavit or other evidence filed after the date of filing a Notice of Appeal, but prior to the date of filing a brief, will not be entered because the affidavit or other evidence failed to overcome all rejections under appeal and/or appellant fails to provide a showing a good and sufficient reasons why it is necessary and was not earlier presented. See 37 CFR 41.33(d)(1).
10. ☐ The affidavit or other evidence is entered. An explanation of the status of the claims after entry is below or attached.

REQUEST FOR RECONSIDERATION/OTHER

11. ☒ The request for reconsideration has been considered but does NOT place the application in condition for allowance because: See Continuation Sheet.
12. ☐ Note the attached Information *Disclosure Statement*(s). (PTO/SB/08) Paper No(s). _____
13. ☐ Other: _____.

Continuation of 11. does NOT place the application in condition for allowance because:

Applicant's amendments in the reply filed on August 24, 2010 have been acknowledged and entered. The reply included amendments to claims 1 and 14 and cancellation of claims 2-4.

Amended claims 1 and 14 now recites limitations of cancelled claims 2-4, which were previously rejected as set forth in the Final office action dated June 7, 2010. Therefore, claims 1, 7-12, 19-21, 54, 56, and 57 are rejected under 35 U.S.C. 103(a) as being unpatentable over Li (WO 02/031463 2, Apr. 18, 2002) in view of DeNuzzio et al. (WO 2004/001404 A1, published on December 31,2003 and filed on June 19, 2003) (hereinafter "DeNuzzio"), Chazalviel et al. (Applied Spectroscopy, 1993, Vol. 47, pp1411-1416) (hereinafter "Chazalviel"), Yoshida et al. (JP 07-184883 A, July 25, 1995) (hereinafter "Yoshida"), and Kuhr et al. (U.S. PG Pub. No. US 2003/0082444 A1, published May 1, 2003 and filed Oct. 26, 2001) (hereinafter "Kuhr") for the reasons set forth in the Final office action dated June 7, 2010.

Applicant's argument that Chazalviel reference, which is cited for teaching a modulated Fourier transform (FT)-IR spectroscope coupled to an array devcie, does not teach modulation of potential difference between two electrodes has been fully considered but is not found persuasive essentially for the reasons of record. In contrast to applicant's interpretation of Chazalviel, the FT-IR spectroscope of Chazalviel is measured at the electrochemical interface, which is the electrodes. The limitation of "the infrared spectroscope is electromodulated by applying potential between the at least two electrodes in at least one of the plurality of cells" is a recitation of the intended use of the claimed invention and must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. The apparatus of Li in view of DeNuzzio, Chazalviel, Yoshida, and Kuhr meets all the structural limitation of claim 1 and would therefore be capable of performing the intended use limitation above.

With respect to the rejection of claims 14-16, 55, 58, and 59, the prior art rejections set forth in the Final office action dated June 7, 2010 have been withdrawn in favor of the new grounds of rejections set forth herein.

Claims 14-16, 55, and 58 are rejected under 35 U.S.C. 103(a) as being unpatentable over Li (WO 02/031463 A2, Apr. 18, 2002) in view of DeNuzzio (WO 2004/001404 A1, published on December 31, 2003 and filed on June 19, 2003), Chazalviel (Applied Spectroscopy, 1993, Vol. 47, pp1411-1416), Kuhr (U.S. PG Pub. No. US 2003/0082444 A1, published May 1, 2003 and filed Oct. 26, 2001), and Girault et al. (U.S. Patent No. 5,512,489, Apr. 30, 1996) (hereinafter “Girault”).

Li teaches an apparatus comprising a condensed array addressed device (see entire document, particularly p8) including a plurality of addressable cells (p8, Detailed Description of the Invention, 1st paragraph), each of the plurality of addressable cells including at least two electrodes (reference elements 1 and 5 in Fig. 2; reference elements 1 and 3 in Fig.’s 1 and 3; and reference elements 3 and 4 in Fig. 5); and a spectroscope optically coupled to the condensed array addressed device (p34, last paragraph and p35). The apparatus of Li further includes microfluidic trench for containing one or more target molecules (reference element 7 in Fig.’s 1 and 3 and p39, 1st paragraph) and a self-assembled monolayer (p17, 1st full paragraph and p23, last paragraph), which reads on the claimed limitation of “a self-assembled interlayer configured to modulate a coverage on the electrodes.”

With respect to claim 14, Li teaches that the plurality of addressable cells define a plurality of sensor elements configured as an array, wherein each of the sensor elements is functionalized to interact with one or more target molecules (p23, 2nd -7th paragraphs); and further comprising control circuitry coupled to the sensor elements, wherein the control circuitry is configured to detect interactions of the sensors with the target molecules (p24, 4th paragraph). The addressable cells of Li contain a first electrode and a second electrode (reference elements 1 and 3 in Fig.’s 1 and 3; and reference elements 3 and 4 in Fig. 5), wherein the first tip of the first electrode and the second tip of the second electrode are located in the microfluidic trench (Fig.’s 1 and 3). The first electrode and the second electrode are each coupled to first and second traces (input and outputs) via first and second conductive plugs, respectively (Fig. 5 and p17, 2nd paragraph). With respect to the limitation of "electrodes having structures and/or charge distributions similar to the target molecule" as recited in claim 14, Li teaches that electrodes further comprises probe molecules that specifically bind to interact with target molecules (p4, last paragraph-p5, 1st paragraph) and that the probe molecules can include nucleotide sequence, which hybridizes with a target DNA (molecular recognition, p12, 2nd paragraph).

With respect to claims 15 and 16, Li teaches the plurality of sensor elements configured as a two-dimensional high-density array (p39, 3rd paragraph), which are addressable by corresponding rows and columns.

With respect to claim 55, Li teaches a target molecule comprising DNA (p12, 2nd paragraph).

With respect to claim 58, Li teaches a signal amplifier (p37, 3rd paragraph).

Li further teaches that a variety of detection methods can be used with the condensed array addressed device including optical detection methods capable of detecting spectral changes upon changes in redox state including fluorescence, phosphorescence, luminescence, chemiluminescence, electrochemiluminescence, and refractive index detection methods. However, Li does not specifically teach that two different detection means, electrochemical and optical (spectroscope), are coupled to the array device. Li further does not specifically teach an apparatus further comprising a waveguide, which includes a total internal reflection prism, wherein the spectroscope is optically coupled to the total internal reflection prism and that the plurality of addressable cells are configured to function as a memory cell array. Li further teaches that other electronic components can be added to the apparatus including circuitry that allows signal processing (p24, 4th

paragraph). However, Li is silent that the plurality of addressable cells is configured to function as a memory cell array. The apparatus of Li includes an array addressed device in a microarray format as set forth above. Although the microarray format of Li would allow the apparatus of Li to be hand-held, Li fails to explicitly teach that the apparatus is a hand-held device.

DeNuzzio teaches microfabricated sensors with multiple working electrodes coupled to both optical and electrochemical detection means allowing the combination of the multiplexed electrochemical detection with optical detection in a single planar microcell (see entire document, particularly Abstract and p5, paragraph [0014]). The combination of various electrochemical, photometric, and other measurements results in a powerful analytical tool capable of measuring multiple properties of an analyte, as well as properties of multiple analytes simultaneously (p9, paragraph 0030]).

Chazalviel teaches Fourier Transform (FT)-infrared (IR) spectroscopy, which is a well-known spectral detection method at the electrochemical interfaces (entire document, particularly p1416, Conclusion). The advantages of FT-IR spectroscopy are well known (p1416, Conclusion). The advantages include good sensitivity and ability to smoothly extract varying contributions due to electronic absorptions and to obtain spectra as complex quantities, which is of considerable help in the identification of the vibration signals and in their ascription to one or the other of the many possible electrochemical processes (p 1416, Conclusion).

Kuhr teaches that array of electrodes are useful for the production of electrochemical memory devices, sensors, and the like as set forth above.

Girault teaches a device which need not be laboratory bound (see entire document, particularly column 3, lines 52-57). The device is a multi-heavy metal ion detector directed essentially at in-the-field measurement which may be used as a portable hand-held device or form part of a remote sensing network (column 3, lines 52-57). The device of Girault et al. electroanalysis can be easily adapted to enzyme chemistry or/and immunochemistry for use as a biosensor (column 7, lines 12-20).

Therefore, it would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to employ a combination of both optical and electrochemical detectors of Li as taught by DeNuzzio in order to allow a combination of multiplexed electrochemical detection with optical detection in a single device.
The advantage of allowing a combination of multiplexed electrochemical detection with optical detection in a single device provides the motivation to combine teachings of Li and DeNuzzio since the combination of various electrochemical, photometric, and other measurement results in a powerful analytical tool capable of measuring multiple properties of an analyte, as well as properties of multiple analytes simultaneously.
One of ordinary skill in the art would have had a reasonable expectation of success in employing the combination of both optical and electrochemical detectors in the device of Li since DeNuzzio teaches that simultaneous detection of both optical and electrochemical signals is possible with the combination of the multiplexed electrochemical detection with optical detection.

Further, it would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to employ the FT-IR spectroscopy of Chazalviel in the apparatus of Li in view of DeNuzzio in order to provide a spectral detection device at the electrochemical interfaces of the condensed array addressed device of Li in view of DeNuzzio for optical detection of biomoleclular interactions.
The advantage of employing a sensitive detection device, which facilitates spectra information in complex quantities, provides the motivation to employ the FT-IR spectroscopy of Chazalviel in the apparatus of Li in view of DeNuzzio with a reasonable expectation of success since the FT-IR spectroscopy is capable of smoothly extracting varying contributions due to electronic absorptions and obtaining spectra in complex quantities permitting identification of the vibration signals.
In addition, it would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to select FT-IR spectroscopy as a detection system, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of design choice. In re Leshin, 125 USPQ 416. Because the claimed apparatus is known in the prior art and has been disclosed as being used with a spectroscope in general, the selection of a specific type of a spectroscope in itself does not present a novel feature of the claimed invention. Since one of ordinary skill in the art at the time of the invention would recognize that a plurality of different types of detection system can be used in the apparatus of Li in view of DeNuzzio for detection of biomolecular interactions based on the same principle of detecting electrochemical species, it would have been obvious to employ a FT-IR spectroscopy as a detection system in the instant claims.

In addition, it would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to use the array of electrodes (the plurality of addressable cells containing electrodes) of Li in view of DeNuzzio and Chazalviel as memory cell array as taught by Kuhr in order to employ the electrode array for both sensing and memory purposes.
The advantage of using the same device for dual purpose provides the motivation to combine teachings of Li in view of DeNuzzio and Chazalviel and Kuhr with a reasonable expectation of success.

Although Li in view of DeNuzzio, Chazalviel, and Kuhr fails to explicitly teach that the apparatus is a hand-held device, one of ordinary skill in the art at the time of the invention would have been motivated to construct the apparatus of Li in view of DeNuzzio, Chazalviel, and Kuhr in a hand-held device format with a reasonable expectation of success since Girault teaches that electrode array biosensor devices can be used as a portable hand-held device, which need not be laboratory bound and has the advantage of allowing in-the-field measurements.

Claim 59 is rejected under 35 U.S.C. 103(a) as being unpatentable over Li (WO 02/031463 A2, Apr. 18, 2002) in view of DeNuzzio (WO 2004/001404 A1, published on December 31, 2003 and filed on June 19, 2003), Chazalviel (Applied Spectroscopy, 1993, Vol. 47, pp1411-1416), Kuhr (U.S. PG Pub. No. US 2003/0082444 A1, published May 1, 2003 and filed Oct. 26, 2001), and Girault (U.S. Patent No. 5,512,489, Apr. 30, 1996) as applied to claim 14 above, and further in view of Torch (U.S. Patent No. 6,163,281, Dec. 19, 2000) and Wohlstadter et al. (U.S. Patent No. 6,090,545, July 18, 2000) (hereinafter "Wohlstadter").

Li in view of DeNuzzio, Chazalviel, Kuhr, and Girault teaches an apparatus comprising a condensed-array addressed device and an optically coupled spectroscope as set forth above. However, Li in view of DeNuzzio, Chazalviel, Kuhr, and Girault fails to teach an apparatus further comprising a video display.

Torch teaches that data may be displayed graphically on a computer of video screen or other electronic display device (see entire document, particularly column 8, lines 13-29).

Wohlstadter teaches that signal processing means such as a digital computer can be used for transferring, recording, analyzing and/or displaying the results of assays (see entire document, particularly column 42, lines 59-63).

Therefore, it would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to employ a computer of Torch with a video screen/display in the apparatus of Li in view of DeNuzzio, Chazalviel, Kuhr, and Girault in order to use the computer for transferring, recording, analyzing and/or displaying the results of assays. The advantage of allowing the transfer, recording, analysis and/or displaying of the assay results provides the motivation to combine teachings of Li in view of DeNuzzio, Chazalviel, Kuhr, and Girault and Torch with a reasonable expectation of success since Wohlstadter teaches that signal processing means such as a digital computer can be used for transferring, recording, analyzing and/or displaying the results of assays.

Since the prior art fulfills all the limitations currently recited in the claims, the invention as currently recited would read upon the prior art.

No claim is allowed.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, THIS ACTION IS MADE FINAL. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to UNSU JUNG whose telephone number is (571)272-8506. The examiner can normally be reached on M-F: 9-5.
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Shibuya can be reached on 571-272-0806. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.
Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Unsu Jung/
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Primary Examiner
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